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Tooth sensitivity and its influence on life quality

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1. ABSTRACT

The aims of this study were to determine the prevalence of cervical dentine sensitivity (CDS) among patients attending a dental hygienist clinic, both self-reported and clinically observed. To report on perceived triggering and relieving factors of CDS, and to compare self-reported and clinical findings. In addition, to identify associations between the impact of oral health on life quality (OHQOL) and CDS.

Patients (178) attending a hospital hygienist clinic underwent a clinical examination for CDS using evaporation assessment, and were interviewed about their experience of CDS. In addition, the impact of oral health on life quality was assessed using the OHIP-14 measure.

Many claimed to experience CDS (58%, 114) and were diagnosed clinically (76%, 151) as having the condition. There was moderate to good agreement between self-reported and clinical findings relating to CDS. Cold food and drinks appeared to be the principal triggering factors of CDS. Most tried to mange the condition themselves; most frequently using desensitising denitrifies. The impact of oral health on quality of life of the group was considerable (89%, 176 experienced one or more impacts) and was associated with self-reported experience of CDS ($P<0.05$), self-reported severity of CDS ($P<0.05$), self-reported frequency of CDS encountered ($P<0.01$) and whether they sought care for CDS ($P<0.05$). In addition, OHQOL was associated with clinical findings: presence of CDS ($P<0.01$), severity of CDS ($P<0.05$) and location of CDS within the mouth ($P<0.05$).

The study concludes that the prevalence of CDS among the group was high and influenced the impact that oral health had on their life quality (OHQOL). OHQOL was associated with patients' self-reported experience of CDS and clinical findings. This has implications for understudying the impact of CDS on patients' lives and in evaluating outcomes.

2. INTRODUCTION

Cervical dentine sensitivity (CDS) is a painful response to thermal, physical or chemical stimulation of the cervical area of the tooth (Chabanski and Gillam, 1997). A condition in which a sound exposed dentinal surface is sensitive to various stimuli that would not usually provoke discomfort (Flynn et al., 1985). Detailed national epidemiology studies on the prevalence of CDS in the general population are lacking. However, some suggest that it can affect up to 35% of the population at any one time (Gillam et al, 1999) and that 40 million Americans suffer from it at some time in their lives (Scherman and Jacobsen, 1992). Though, the reported prevalence of this clinical condition varies considerably depending on the population studied and methodology used to evaluate it.

Findings from studies carried out among dental hospital study populations suggest that the prevalence of CDS is considerable, with over half of the subjects reporting CDS (Chabanski et al., 1997, Orchardson and Collins, 1987). In particular, the prevalence of CDS appears to be high among periodontal patient groups, suggesting that periodontal diseases and/or treatment effects play a role in its aetiology (Chabanski et al., 1996). In contrast, CDS in general practice populations tends to be lower than in dental hospital populations (Gillam et al, 1999). Although, others suggest that the level of CDS is increasing in the general population and that a high prevalence of general practice patients claim to experience CDS (Irwin and McCusker, 1997). When Dentists' views on the prevalence of CDH have been sought, they estimated that one in ten of their patients had the condition (Schuurs et al., 1995).

Few studies have been carried out in countries other than in the *West*. Although, findings suggest that the prevalence of CDS may be lower in South America (Fischer et al., 1992) and Asia (Liu et al., 1998). However, this in part may reflect cultural differences in the reporting and coping with pain as has been widely reported (Rodrigo et al., 1987; Faucett et al., 1994).

Cold air appears to be a major stimulus for CDS; other commonly reported causes being tooth brushing, hot and sweet stimuli (Chabanski et al., 1996, Gillam et al., 1999). A wide Varity of treatment modalities have been suggested for the management of CDS including localised and general management with the uses of resins, varnishes and restorations (Dowell et al., 1985). Desensitizing toothpaste remains the most commonly employed measures (Schuurs et al., 1995).

CDS has been assessed mainly using self-reporting of the condition or patient's subjective response to four main categories of stimuli: mechanical, chemical, electrical and thermal. Opinions vary as to the reliability of some of these methods of assessment, although no single method of eliciting and assessing CDS may be considered ideal (Gillam and Newman, 1993). Evaporative stimulation, a 1 second blast of cold air from a dental air syringe has been advocated for some time now as a useful tool in assessing CDS (Fitzgerald, 1956) and continues to be widely used today (Morris et al., 1999; Ferrari et al., 1999). Various refinements of evaporative stimulation have been suggested including controlling pressure and temperature (Orchaardson and Collins, 1987). Although, the question as to whether the use of air blast stimulation can be refined to the point of providing a quantifiable method of evaluating CDS has yet to be resolved.

Few studies have examined differences in self-reporting of CDS compared to clinical recordings. It has been suggested that the level of agreement is less than ideal (Gillam and Newman, 1993). Some studies suggest that patients overestimate the prevalence of the condition compared to clinical findings (Fischer et al., 1992).

The range of discomfort caused by CDS is characterised by varying degrees of pain, commonly short lived, lasting from seconds to minutes after the induction of stimuli (Gillam and Newman, 1993). Although apart from pain little is known about the consequences of CDS in terms of how it affects patients' day to day living or life quality. The use of patient centered outcome measures to describe the consequences of oral disease, disorders and pain have been advocated for some time now (Cohen and Jago, 1976). In the past numerous general health related quality of life of measures have been

employed in the assessing the consequences of dental and facial pain (Reisine and Weber, 1989; Zakrzwewska and Feinmann, 1990). However, there are reports that these measures may not be sensitive enough to measure subtle changes in oral health status (Reisine and Weber, 1989; Allen et al., 1999). Since then a plethora of oral health specific quality of life measures have been developed to measures physical, social and psychological consequences of oral health (Slade et al., 1998).

Greater understanding of the consequences of CDS is important in many fronts. In drawing attention to and providing understanding of the importance of CDS compared to other dental and health conditions. To embrace patients views about the physical, social and psychological outcomes of CDS and to inform treatment planning. To evaluate the performance of oral health related quality of life measures in the assessment of CDS and their possible use as outcome measures of treatment.

3. AIM AND OBJECTIVES

The aim of this project was to assess the impact of tooth sensitivity on oral health related quality of life. The objective were:

1. to determine patients' self-reported experience of tooth sensitivity, its intensity and location,

2. to report on patients' views on what factors trigger and relieve tooth sensitivity,

3. to determine the prevalence, intensity and location on tooth sensitivity clinically,

4. to compare the 'objective' clinical findings of tooth sensitivity to patients' self-reported experiences in terms of prevalence, intensity and location,

5. to assess the impact of oral health on life quality using the OHIP-14 questionnaire,

6. to identify clinical and self-reported factors of tooth sensitivity associated with oral health related quality of life.

4. METHODS AND MATERIALS

4.1 Study population

All patients attending the dental hygienist clinic, at the Faculty of Dentistry, University of Hong Kong over a two-week period were invited to participate in the study. Patients were asked to attend the clinic fifteen minutes earlier than their scheduled appointment to undergo a clinical examination and complete a structured questionnaire. Patients were informed that their participation in the study would in no way affect the treatment they received at the hospital at the present time or have any future implications on their care. Participants were provided with information about the purpose of the study and consent was obtained from all patients.

4.2 Data collection

The data collection comprised of two components a structured questionnaire and a clinical oral examination conducted following completion of questionnaire.

The structured questionnaire was developed to assess patients' self reported experience of CDS, the intensity of the pain, location of sensitive teeth, initiating ('triggering') and relieving factors (*Appendix 1*). Some socio-demographic information was collected. The questionnaire was developed from a review of the literature on self reported CDS. The questionnaire was translated from English to Chinese and piloted among a patient group and refined where necessary. In addition, the impact of oral health on life quality was assessed using the OHIP-14 measure (Slade, 1997). This instrument has been used in a wide variety of studies (globally) to assess oral health impact: functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap (Slade and Spencer, 1994; Locker and Slade, 1994; Slade et al., 1996; Allen et al., 1999). A Chinese version of the measure has been developed and its psychometric priorities evaluated (Wong et al, 2000).

Following a full mouth charting of the oral health status of the patient (*Appendix 2*). An air blast sensitivity test was chosen as the primary measure of CDS. Each tooth was tested for CDS and rated on the Schiff sensitivity scale, *Table 1*. The tooth being tested was isolated from adjacent teeth by examiner's fingers. A blast of air from a dental syringe (3 in 1) placed perpendicular to the buccal cervical area of each tooth was administered for one second from a distance of 1cm away from the tooth surface. The pressure of the air blast was recorded during examination, it ranged from 36psi to 38psi. In addition, the temperature of the air blast was recorded, it ranged from 22°C to 24°C. Three trained and calibrated examiners carried out the examination. During the survey 10% of the subjects were reexamined for CDS and inter examiner reliability as measured by the Kappa statisistc ranged from 0.58-0.64, which indicated moderate to good reliability.

Table 1: The Schiff Air Blast Sensitivity Scale (Schiff et al., 1994)

0= Tooth/ patient does not respond to air stimulus.
1= Tooth/ patient responds to air stimulus but does not request discontinuation of stimulus.
2= Tooth/ patient responds to air stimulus and move away from stimulus.
3= Tooth/ patients responds to air stimulus, considers stimulus to be painful, and requests discontinuation of the stimulus

4.3 Data analysis

The data were coded and analysed using the statistical package SPSS. Frequency distribution tables were produced of patients' self-reported experience of CDS: prevalence (existence), history of CDS, intensity, and location. In addition information about their concern about CDS, their perceptions of what factors triggered and relieving CDS was explored.

From the clinical data, the prevalence, intensity and mean number of teeth affected by CDS were examined. A comparison between patients' self reported experience of CDS and clinical 'objective' recording of CDS was explored: prevalence, intensity, and location.

The impact of CDS on patient life quality was explored through examining responses to the items of OHIO-14. OHIP-14 scores were generated by summating responses to the 14 items on a five point Likert scale (0=never, 1=seldom, 2=sometimes, 3= often, 4 =always). Variations in life quality (OHIP-14 score) in relation to self-reported and clinical findings were examined.

5. RESULTS

5.1 Response rate

The response rate to the study was 78%, with 198 of the 254 patients participating in the study. Non participants sited time and other commitments as reasons for not wishing to participate. The study group was predominately female 114 (57.6%); 84 (42.4%) males participated. The age range of the subjects was 17- 80, with a mean age of 46.6 years old (SD 15.39).

5.2 Patients self reported experience of CDS

The majority of participants 58% (114) claimed that they were currently experiencing dental hypersensitivity and 62% (122) reported that they had dental hypersensitivity before.

Out of the 114 subjects having hypersensitivity at the time of study, 35% (40) subjects were males and 65% (74) were females. The majority (73%, 83) claimed that they were suffering from CDS for more than a year and over a quarter (27%, 31) claimed that they frequently encountered bouts of CDS ('often' or 'always'). More frequently they reported CDS posterior rather than the anterior region of their mouth. Most (52%, 60) rated the pain they experience with CDS greater than 4 on a scale from 0-10, indicative of moderate and severe pain. Over forty percent were 'moderately' or 'extremely' concerned about CDS. Details of the status and information about dental hypersensitivity were shown in *Table 2*.

Table 2. Status and Information about dental hypersensitivity

		No of subjects	Percentage
Past hypersensitivity	Yes	122	62
	No	76	38
Current hypersensitivity	Yes	114	58
	No	84	42
Existence of hypersensitivity (among current suffers)	<6 months	19	17
	6-12 months	12	10
	1-3 years	35	31
	>3 years	48	42
Frequency of hypersensitivity (among current suffers)	Seldom	21	18
	Sometimes	62	55
	Often	22	19
	Always	9	8
Reported location (among current suffers)			
Anterior	Upper left	29	25
	Upper right	31	28
	Lower left	27	24
	Lower right	26	23
Posterior	Upper left	45	40
	Upper right	37	33
	Lower left	39	34
	Lower right	38	33
Pain intensity score (among current suffers)	0	5	4
	0.1-3.9	49	43
	4.0-6.9	42	37
	7.0-10.0	18	16
Concern about dental hypersensitivity (among current suffers)	Never	9	8
	Slightly	58	50
	Moderately	36	32
	Extremely	11	10

For the patients with dental hypersensitivity, most of them (75%, 90) claimed they experience the pain when eating or drinking cold foods and drinks; and approximately a third (34%, 40) claimed it was brought on during teeth brushing. Other triggering factors of CDS are presented in *Figure 1*.

Most reported (52%, 62) that they tried to solve the problem by themselves. The most common way was avoidance of the stimuli that caused their pain, *Figure 2*. Such as avoiding eating or drinking cold foods and drinks, and avoiding sour foods and drinks.

Figure 1 Reported 'triggering' factors of CDS

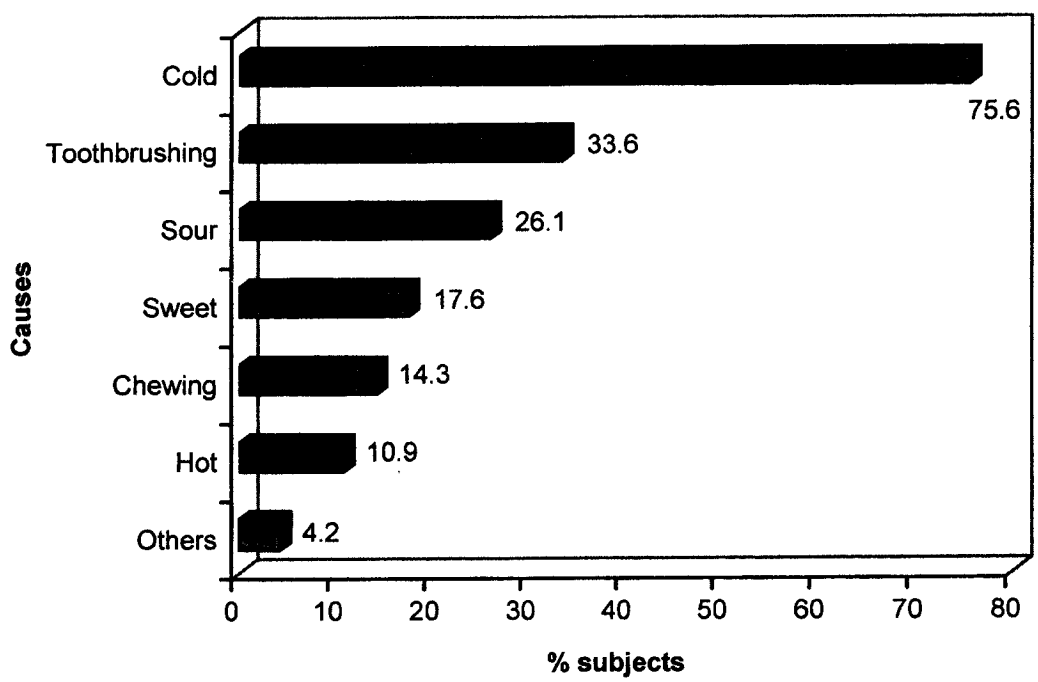
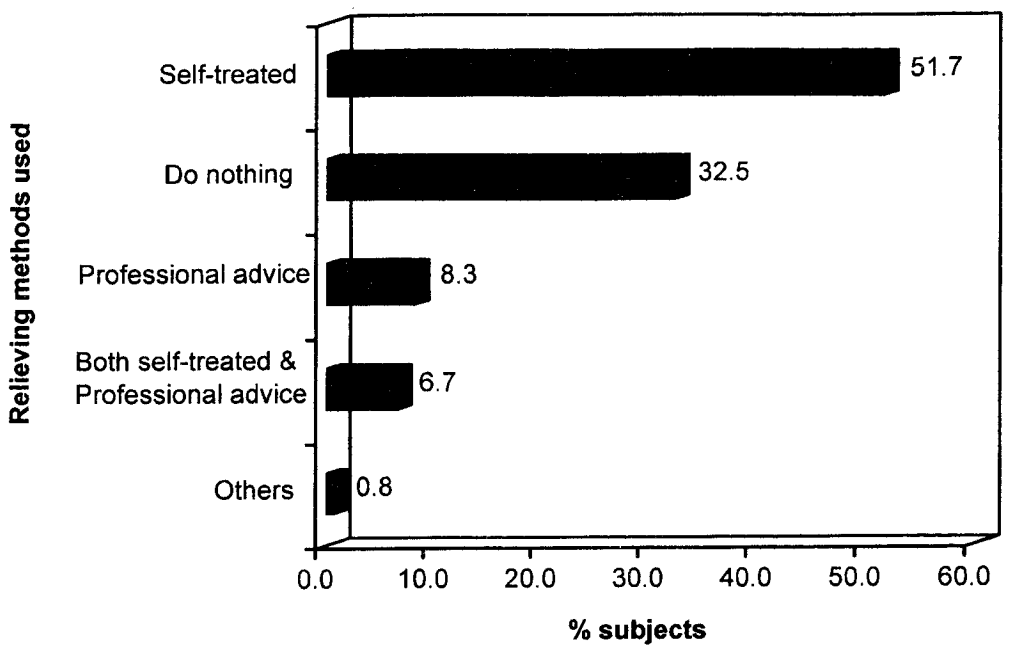


Figure 2 Reported relieving factors of CDS

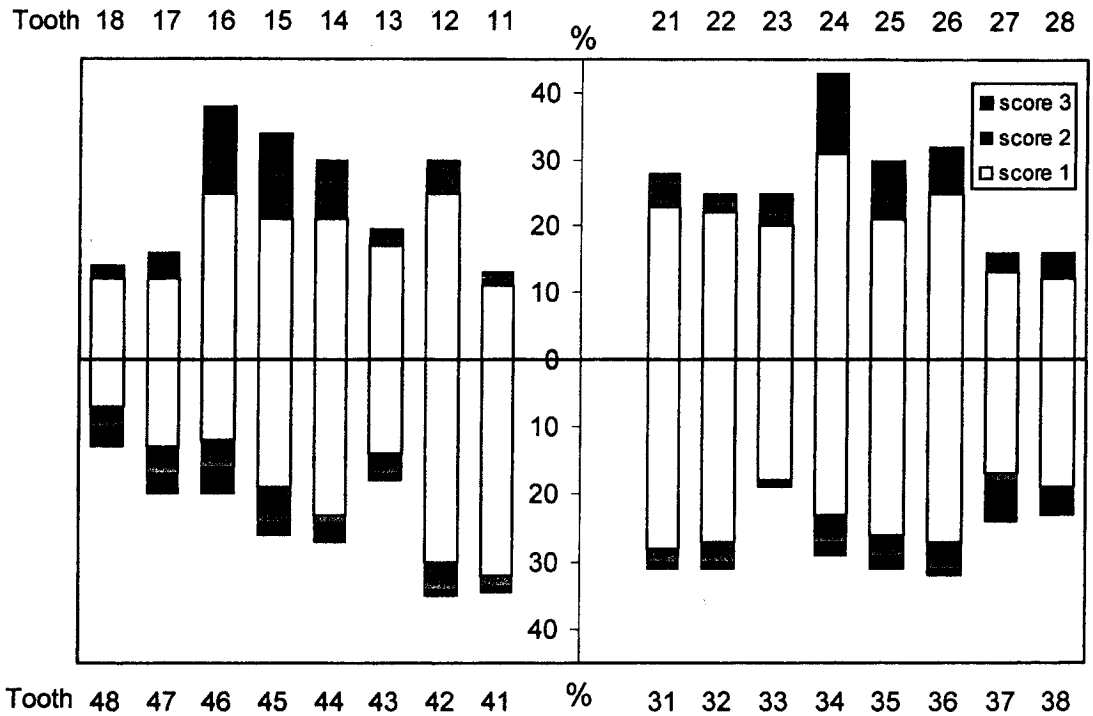


5.3 Clinical measurement of CDS

Over three-quarters of the group (76%, 151) were diagnosed clinically as having CDS, and among them, they had on average 6.64 teeth that were affected (SD 5.25). Less frequently canines were affected compared to other teeth in the mouth, however the proportion of teeth affected was high in each location, *Figure 3*.

Among those who had clinical evidence of CDS (employing the Schiff scale of hypersensitivity), the group had on average 5.27 (SD 4.06) teeth that were rated 1, a mean of 0.81 (SD 1.71) teeth that were scored 2, and a mean of 0.56 teeth (SD 1.64) that scored 3. Nineteen-percent (28) considered the air stimulus to be painful (highest score = 3), and requests discontinuation of the stimulus. A quarter (38) responded to the air stimulus by moving away from stimulus (highest score = 2) and 56% (85) responded to the air stimulus but did not request discontinuation of the stimulus (highest score = 1).

Figure 3: Location of CDS clinically



5.4 Clinical measure versus self-reported

Clinical 'objective' measurement of CDS differed from self-reported experience of CDS. There was 75% agreement between self-reported experiences of CDS and clinical findings. However, where there was disagreement it tended to be that people claimed they didn't have sensitively yet on clinical examination there was evidence of CDS, *Table 3.*

Table 3: Clinical versus self reported experience of CDS: prevalence

		Self reported No	Self reported Yes	Percentage in agreement	McNemar p-value
Clinically	No	41 (49%)	6 (5%)	75	<0.001
	Yes	43 (51%)	108 (95%)		

Clinically, the intensity of CDS was measured according to the highest scores recorded for the subjects. The clinical intensity of CDS was compared to the self reported intensity of CDS (rated on a pain VAS from 0-10), no significant relationship was found, *Table 4*. In general, the intensity of pain from CDS was greater relying on clinical measurement than on patients' perceptions.

The majority of the patients who rated the pain they experienced from CDS as between 0-3.9 also did responds to the air stimulus but did not request to discontinue (Schiff score 1). However, many of those who responded to the air stimulus and that requested to discontinue it, reported the pain they experienced from CS in their daily life as low (rated 0-3.9). Similarly, many who responded to air stimulus and moved away from the stimulus rated the pain they experienced from CDS as low (0-3.9) or moderate (4-6.9).

Table 4: Clinical versus self reported experience of CDS: intensity

		Clinical pain intensity (by highest score recorded)			
		0	1	2	3
Self reported pain intensity	0	1 (17%)	3 (5%)	0 (0%)	1 (4%)
	0.1-3.9	1 (17%)	31 (53%)	12 (46%)	5 (21%)
	4.0-6.9	4 (66%)	15 (26%)	9 (35%)	14 (58%)
	7.0-10.0	0 (0%)	9 (16%)	5 (19%)	4 (17%)
		6	58	26	24

χ^2 exact test, $p = 0.068$

There was moderate (47.6%) to good (67.3%) agreement between self-reported location of CDS and clinical findings. In all sites a higher prevalence of CDS was recorded following clinical examination compared to patients views. In particular, the level of agreement was high in the lower anterior region and worse in the posterior region of the mouth, *Table 5*.

Table 5: Clinical versus self reported experience of CDS: location

Clinically found CDS		Self reported CDS		Percentage	McNemar
		No	Yes	in agreement	p-value
Anterior upper left	No	47 (56%)	10 (35%)	58.4	0.001
	Yes	37 (44%)	19 (65%)		
Anterior upper right	No	54 (66%)	16 (52%)	61.1	0.096
	Yes	28 (34%)	15 (48%)		
Anterior lower left	No	55 (64%)	8 (30%)	65.5	0.001
	Yes	31 (36%)	19 (70%)		
Anterior lower right	No	58 (67%)	8 (31%)	67.3	0.001
	Yes	29 (33%)	18 (69%)		
Posterior upper left	No	29 (43%)	14 (31%)	53.1	0.001
	Yes	39 (57%)	31 (69%)		
Posterior upper right	No	30 (40%)	13 (35%)	47.8	0.001
	Yes	46 (60%)	24 (65%)		
Posterior lower left	No	33 (45%)	14 (36%)	51.3	0.001
	Yes	41 (55%)	25 (64%)		
Posterior lower right	No	42 (56%)	15 (40%)	57.5	0.001
	Yes	33 (44%)	23 (60%)		

5.5 Oral health related quality of life

The OHIP-14, a 14-item questionnaire was used to assess the relationship between oral health status and quality of life. The majority, 89% (176) claimed that their oral health impacted on their life quality in one or more ways in the past year. Most frequently experiencing difficulties in chewing, *Table 6*. OHIP-14 scores ranged from 0 to 49, the mean score was 8.65 (SD 8.78), the median score was 6 (interquartile range from 2 to 13).

Table 6: Impact of oral health on life quality

	0= Never	1= Seldom	2= Sometimes	3= Often	4= Always
a. Difficulty in pronunciation	66.9	15.7	10.7	1.0	3.0
b. Diminution in taste	69.4	15.3	11.2	1.0	3.1
c. Spontaneous pain	44.4	24.7	23.7	2.5	4.5
d. Discomfort in chewing	32.1	27.0	30.6	5.1	5.1
e. Discomfort in front of others	55.9	15.4	20.0	4.1	4.6
f. Nervousness derived from oral cause	57.4	18.8	15.7	3.6	4.6
g. Dissatisfactory in quality of meal	67.2	18.5	10.8	0.5	3.1
h. Neccessity to clean teeth during a meal	70.2	14.1	10.6	2.5	2.5
I. Inability to be at ease	63.8	21.4	10.7	0.0	4.1
j. Embrassed in front of other	59.4	17.8	14.7	2.5	5.6
k. Easily agitated	82.3	13.6	2.5	0.5	1.0
l. Affect ability to perform tasks	72.7	16.7	8.1	0.5	2.0
m. Dissatisfed with daily life	71.9	16.8	7.7	2.6	1.0
n. Inability to perform anything	83.3	12.6	2.0	0.0	2.0

Age of the patients had a weak correlation with OHIP-14 scores (Spearman's correlation coefficient = 0.16, $P<0.05$). Gender was not associated with OHIP-14 scores.

Variations in OHIP-14 score were apparent in relation to self-reported experience of CDS *Table 7*, with those currently experiencing CDS encountering a greater number of oral health impacts ($P<0.05$). Furthermore, those who claimed they experienced 'intense' pain from CDS (rating it between 7 and 10, on a 0-10 scale) had poorer oral health related quality of life compared to others in the study group ($P<0.05$). Those who claimed they were 'extremely' concerned about their CDS had higher OHIP-14 scores compared to the rest of the group ($P<0.05$). Those who claimed they experienced CDS 'often' or 'always'

had poorer oral health related quality of life compared to the rest of the group (*P<0.01).* Those who report 'going to see a dentist' about their CDS has significantly poorer oral health related quality of life (P<0.05).

Table 7: OHIP-14 scores and self-reported CDS

		Mean (SD)
CDS experience*	Yes (n=114) No (n=84)	9.9 (9.1) 7.0 (8.1)
Intensity of CDS*	rated between 7-10 (n=18) rated between 0-6.9 (n=180)	8.2 (8.5) 13.3 (9.9)
Frequency of CDS experience**	Frequently (n=31) Not frequently (n=167)	14.1 (11.1) 7.7 (7.9)
Sought help about CDS*	Yes (n=10) No (n=188)	14.2 (13.5) 8.4 (8.4)
Concern about CDS	Yes (n=48) No (n=150)	10.0 (9.1) 8.2 (8.7)

* P<0.05, ** P<0.01

Clinical findings were also associated with oral health related quality of life, *Table 8.* Those who had one or more sensitive teeth (as assessed by the air blast test) had higher OHIP-14 scores compared to the rest of the study group (*P<0.01*). Furthermore, the number of sensitive teeth was associated with, but weakly so with OHIP-14 scores (Spearman's correlation coefficient = 0.22, P<0.01). Oral health related quality of life was also associated with the intensity or severity of CDS (K-W, *P<0.05*). In addition, It was also observed that OHIP-14 scores were associated with the clinical observed position of CDS (K-W, P<0.05).

Table 8 OHIP-14 scores and clinical findings

		Mean (SD)
Experiencing CDS**	Yes (n=151)	9.5 (9.4)
	No (n=47)	5.8 (5.7)
		Median (interquartile range)
Intensity of CDS*	Highest score 3 (n=28)	8.5 (4.0 – 16.8)
	Highest score 2 (n=38)	8.5 (2.0 – 14.5)
	Highest score 1 (n=85)	6.0 (2.0 – 12.5)
	Highest score 0 (n=47)	4.0 (2.0 – 9.0)
Location of CDS*	Posterior and anterior (n=101)	8.0 (3.0 - 16.0)
	Posterior only (n=35)	5.0 (2.0 - 13.0)
	Anterior only (n=15)	6.0 (3.0 – 9.0)
	Nowhere (n=47)	4.0 (2.0 – 9.0)

* K-W test, $P<0.05$, ** t test, $P<0.01$

6. DISCUSSION

6.1 Response rate

The response rate to the study was high suggesting that the dental hygienist clinic in the faculty maybe a suitable environment for conducting research. The success in recruiting participants could be attributed to a number of factors: a telephone call prior to the survey to explain the purpose of the study, the provision of an additional 15 minutes appointment prior to participants' hygienist visit to conduct the survey, and patients willingness to describe how CDS affects their day to day life and life quality. In addition, the cooperation and encouragement of the dental hygienists undoubtedly influenced the successful response rate.

6.2 Prevalence of CDS

Over half the patients (58%) claimed they were *currently* experiencing CDS and over 60% claimed they had experienced CDS in the past. In addition, three-quarters were diagnosed clinically as having evidence of CDS. This suggests a very high prevalence of CDS among the study population. Almost twice as prevalent as what has been reported in a study of the prevalence of CDS among patients attending a Health Examination Center of a University hospital in Taipei (Liu et al, 1998). However, the current study group was patients attending a dental hygienist clinic whom were likely to have periodontal health problems including gingival recession, factors known to be associated with CDS (Chabanski et al., 1996). Chabanski et al. (1996) also reported a somewhat similar prevalence of CDS among patients referred to a periodontal department.

The principal triggering factors was cold air and tooth brushing and these have widely been reported as factors that provoke CDS (Fischer et al., 1992; Chabanski et al., 1996; Gillam et al., 1999; Rees, 2000). Most tried to deal with the problem themselves and few sought professional advice and/or care. This appears to be patients' approach to the

management of CDS in many countries irrespective of health care delivery systems (Fischer et al., 1992; Chabanski et al., 1996; Gillam et al., 1999)

6.3 Severity and location of CDS

The majority of patients when asked to rate the pain they experienced from CDS on a scale from 0-10, rated it as above 4, suggesting that they experienced moderate or severe pain. Moreover, 15% of them rated the pain they experienced as above 7, indicative of severe pain. Likewise many responded to the air stimulus or requesting discontinuation of the stimulus. Furthermore over a quarter encountered CDS 'often or always in their daily life' and over 40% were 'moderately or extremely' concerned about it. This is in keeping with the views of dentists in a Dutch study that suggested that CDS is a significant clinical problem in dental practice and that on average 10% of their general practice patients reported moderate cervical pain and 1% reported severe pain (Schuurs et al., 1995).

Patients reported that they most frequently experienced CDS from their posterior teeth and likewise this was observed in clinical examination. It has been reported that that posterior teeth are more likely to be affected by CDS than anterior teeth (Rees, 2000).

6.4 Clinical versus self reported experience of CDS

When comparing the prevalence of CDS; self-reported versus clinical 'objective' findings, there was 75% agreement. This represents good agreement on the presence or absence of CDS and suggests that patient perceptions on the presence of CDS are reliable. However, where there was disagreement between clinical and self reported findings it tended to be cases where the patients claimed they did not have CDS yet it was observed clinically. The somewhat higher prevalence of CDS observed clinically maybe attributed to many reasons. The type of stimulus used in the clinical examination was a cold air-blast and this as the findings suggest is the most common trigger or stimulus of CDS. In addition, patients were told to report if they experienced CDS when the air stimulus was applied to

the tooth; this may have increased their awareness towards CDS and thus their likelihood of reporting it during clinical examination. This is in contrast to the findings of others who suggest that patients over report CDS compared to clinical examination (Flynn et al 1985, Fischer et al 1994). This may be due to ethnic, racial and cultural difference in reporting dental pain (Rodrigo et al., 1987; Faucett et al., 1994).

The intensity of pain from CDS was greater relying on clinical measurement than on patients' perceptions. This may have been because the air-blast stimulus - a blast of cold air from a 3in1 syringe under pressure for one second - may be much greater than patients are likely to encounter in their daily life. Moreover, the adjacent teeth were isolated in the clinical exam and this may make CDS to be more easily perceived by the patient because of the contrast feelings with adjacent teeth.

When the location of CDS, self-reported versus clinical was compared, the percentage of agreement was moderate with agreement on the area of CDS ranging from 51% to 67 %. In particular agreement was good in the lower anterior region. This may be because anterior teeth are more exposed than posterior teeth anatomically and thus more likely to be exposed to stimulus in daily life compared to posterior teeth. In all regions the presence of CDS was more frequently recorded on clinical examination compared to self-reported experience and this as mentioned maybe because the air blast stimulus is an exaggerated stimulus unlikely to be experienced in day to day living.

6.5 Oral health related quality of life

Increasingly there is an awareness of the physical, social and psychological consequences of oral health status (Locker, 1988). A plethora of measure have been developed to quantify the influence of oral health on life quality and OHIP, the oral health impact profiled has proved to be a useful instrument to assess oral health related quality of life (Slade et al., 1998). To date some information is available about oral health status and quality of life and suggest that clinical oral health status is associated with life quality. Tooth loss is thought to be an important factor that determines the influence oral health

has on life quality (Locker and Slade, 1993). In addition, several studies have suggested that dental caries status, both coronal and root caries is associated with life quality (Locker and Slade, 1994; Slade et al, 1996). Similarly, periodontal health status is known to influence oral health related quality of life (Locker and Slade, 1994). This study represents one of the first studies to report on the impact of CDS on life quality.

The impact of oral health on the life quality of the study was considerable with approximately ninety per cent experiencing one or more impacts in the previous year. Most frequently the patients claimed that their oral health status impacted on them physically detracting from their eating. This high prevalence of impact may be attributed to a number of factors. Firstly, their age; the group was largely middle age, and older people as it has been suggested, are likely to experience or report to experience more negative attributes of oral health than younger people (Slade et al., 1996). Secondly, the group was predominantly female, and women as it has been suggested are more likely or willing to describe how their health status affects them (Broersen et al, 1996). Thirdly, it may reflect ethnic, cultural and race differences in perceptions of oral health. Although many studies claim that Chinese people are less likely to *experience* or report oral health problems (Pau and Croucher, 1997).

Interestingly, both self-reported perceptions of CDS (presence, severity, frequency encountered, and whether they sought care) and clinical diagnosis of CDS (presence, severity and location) were associated with OHIP scores (and life quality). This has implications for providers of care in understanding the consequences of CDS on patients' lives and the importance of managing CDS for the overall well being of patients. Furthermore, it demonstrates the performance and sensitivity of patient centered outcome measures in orofacial pain and periodontology. This is likely to have implications in understanding patients needs and in embracing patient partnership in treatment planning. Moreover, the use of oral health related quality of life measure may become an important tool in assessing outcomes and evaluating management approaches to CDS to inform evidence based dental practice.

7. CONCLUSIONS

- The majority of patients attending the dental hygienist clinic at Hong Kong's dental school claimed that they currently experiencing cervical dentine sensitivity (CDS) or did so in the past. Many of the sufferers rated the pain they experienced as moderate or severe and had the problem for a number of years. They claimed it most frequently affected their posterior teeth.

- Cold foods and drink were reported to be the principal triggering factors of CDS by the patient group. Most tried to deal with the problem them selves by avoiding triggering factors and few had sought professional advice.

- The majority (76%) was diagnosed 'clinically' as having CDS, but it was of low insensitivity. Canines were less frequently affected than other teeth.

- There was good agreement between self-reported and 'clinical' findings regarding the prevalence of CDS and moderate to good agreement about the location of CDS. However, there was disagreement about the intensity of the pain between clinical and self-reported findings.

- Most (89%) claimed their oral health impacted on their life quality during the past year. This was associated with clinical and self-reported findings relating to CDS. This suggests that CDS does have an impact on life quality. Moreover, it demonstrates the discriminative ability of patient centered measures such as OHIP-14 in assessing CDS.

8. FUTURE RECOMMENDATIONS

1. It may be useful to assess the prevalence of CDS in the *general* Hong Kong population to gain an understating of the importance of this condition.

2. In understating the consequences of CDS on patients' lives the OHIP-14 measure may be a useful measure to embrace their views in assessing oral health needs and also to facilitate treatment planning,

3. Patient centered outcome measure like the OHIP-14 may be useful adjunct tool in assessing the effects of various treatment modalities aimed at reducing CDS,

9. ACKNOWLEDMENT

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Appendix 1a

Questionnaire on Dentine Hypersensitivity

A. Basic information

Name: _____ Date of Birth: ___ / ___ / 19__ Age: _____
Gender: M F PPDH no.: _____
Contact no.: _____

B. Medical History

1.Are you suffering from any chronic illness? Yes No
If Yes, please specify. _____

2.Are you undergoing any medical treatment? Yes No
If Yes, please specify _____

3.Are you taking any medication at the moment? Yes No
If Yes, please specify _____

4. Do you have any allergy to drugs/ food? Yes No
If Yes, please specify _____

C. Oral hygiene and Dental History

5. What is the frequency of brushing your teeth per day?
0 time 1 time 2 times more than 2 times

6. What types of toothbrush do you use?
Soft bristles Medium bristles Hard bristles

7. What types of dental treatment have you received before? (more than 1 option could be selected)
Scaling Restorations Periodontal Surgery Crowns/ Bridges

Orthodontics Extractions Others _____

D. About Sensitive teeth

8. In the past, have you had sensitive teeth? Yes No

9. At present, do you have sensitive teeth? Yes No
   If yes, how long have you had the problem?
   <6 months Between 6-12 months
   Between 1-3 years More than 3 years

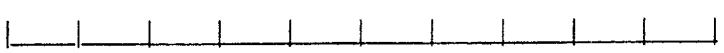
10. How often do you have the problem?
   Seldom Occasionally
   Always Most of the time

11.Where are your sensitive teeth?

	Front	Back
Upper left		
Upper right		
Lower left		
Lower right		

12. From a scale of 1-10, how would you rate the pain you experienced from your sensitive teeth?

0 1 2 3 4 5 6 7 8 9 10



No pain most painful

13. How concern are you about the pain?
   Not concerned Slightly concerned
   Moderately concerned Severely concerned

14. Which of the following event(s) trigger your problems of sensitivity? (More than 1 option could be selected)

Take **Hot** food/ drinks
Take **Cold** food/ drinks
Take **Sour** food/ drinks
Take **Sweet** food/ drinks
Biting
Brushing teeth
Others _____

15. What have you done to relieve your pain?

Do nothing
Self treatment (Without treatment and advice from dentists)
Use desensitizing toothpaste
Avoid taking **Hot** food/ drinks
taking **Cold** food/ drinks
taking **Sour** food/ drinks
taking **Sweet** food/ drinks
Brushing around the sensitive teeth
Brushing hard
Others _____
Seek help from dentists
What did the dentist do to improve your situation?
Prescribed desensitizing toothpaste
Apply topical agents (i.e. paint on surface of teeth)
Restorations (i.e. fillings)
Instructed you to brush differently
Gave you dietary advice
Others _____

16. How often do you consume sour food, soft drinks or fruit juice?

Frequently Occasionally Seldom

~ This is the end of the questionnaire, thank you for your help! ~

Appendix 1b

姓名:_____ 出生日期 __/__/19__ 性別: O 男 O 女 病人編號 _____ 聯絡電話 :_____

1.	你以往曾否有牙齒敏感?	O 有	O 沒有
2.	你現在有沒有牙齒敏感?	O 有	O 沒有
	如第一、二題答案是『沒有』，請跳至回答第十二題，否則繼續回答下列各題。		
3.	牙齒敏感的問題存在了多久?	O 少於6個月 O 6個月至1年之間	O 1年至3年之間 O 多於3年
4.	牙齒敏感的問題出現有多頻密? (可選擇多於一個答案)	O 很少有 O 有些時候有	O 常常有 O 大部份時間都有
5.	你的敏感牙齒位置在:	前面牙齒 O 左上 O 右上 O 左下 O 右下	後面牙齒 O 左上 O 右上 O 左下 O 右下
6.	在0和10分之間, 你認爲你因牙齒敏感導至痛楚的程度有幾分?	**0** **10** 沒有痛楚 十分痛	
7.	你對牙齒敏感導至的痛楚有多關注?	O 不關注 O 有些關注	O 很關注 O 十分關注
8.	在下列舉出的什麼時侯你會特別感痛楚? (可選擇多於一個答案)	O 吃/喝熱的東西 O 吃/喝酸的東西 O 咀嚼時 O 其他	O 吃/喝冷的東西 O 吃/喝甜的東西 O 刷牙時
9.	你用什麼方法去減輕痛楚?	O 沒有做什麼(請回答第十二題) O 自己解決 (在沒有牙醫的治療及建議的情況下) (請回答第十題) O 尋求牙醫協助(請回答第十一題) O 其他	
10.	如你自己解決 (在沒有牙醫的治療及建議的情況下)，你會	O 用抗敏感牙膏 O 避免吃/喝熱的東西 O 避免吃/喝冷的東西 O 避免吃/喝酸的東西	O 避免吃/喝甜的東西 O 避免刷敏感的牙齒 O 避免大力刷敏感的牙齒 O 其他____
11.	如你尋求牙醫協助，你的牙醫會	O 建議你用抗敏感牙膏 O 在你牙齒上塗上藥物 O 補牙	O 導你用不同的方法刷牙 O 建議你改變飲食習慣 O 其他____
12.	你吃酸的食物, 喝汽水或果汁的次數有多頻密?	O 每天一次或以上 O 每星期數次	O 每星期一次或以下
13.	你每天刷牙多少次?	O 0次 O 1次	O 2次 O 多於2次
14.	你所用的牙刷是什麼類型?	O 軟毛 O 中毛	O 硬毛
15.	你以往曾經接受過哪項牙科治療?	O 洗牙 O 矯齒 O 補牙 O 脫牙	O 牙週手術 O 牙套/牙橋 O 根管治療 O 其他____
16.	你現在有沒有患有慢性疾病?	O 有，請註明 _____	O 沒有
17.	你現在有沒有接受任何醫藥治療?	O 有，請註明 _____	O 沒有
18.	你現在有沒有服食任何藥物?	O 有，請註明 _____	O 沒有
19.	你有沒有對食物或藥物有敏感?	O 有，請註明 _____	O 沒有

20. 請回答所有問題，並在在適當的格內填上剔號。每題只選一個答案。

在過去一年裏，

	經常	多數	間中	好少	無
a. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)令你發音有困難?	○	○	○	○	○
b. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而覺得食物比以前淡味?	○	○	○	○	○
c. 你有幾多時候口腔自己會痛(不弄不踫也覺得痛)?	○	○	○	○	○
d. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而進食時覺得不舒服?	○	○	○	○	○
e. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而在其他人面前覺得不自在?	○	○	○	○	○
f. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而令你緊張?	○	○	○	○	○
g. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而不滿意現在的飯餐(可以吃到的飯菜)?	○	○	○	○	○
h. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而在用膳中途需要整理牙齒/假牙方能繼續進食?	○	○	○	○	○
i. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而令你難以放鬆(鬆弛)?	○	○	○	○	○
j. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而在其他人面前覺得尷尬?	○	○	○	○	○
k. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而在其他人面前易於發怒?	○	○	○	○	○
l. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而影響你平日工作?	○	○	○	○	○
m. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而令你覺得不那麼滿意自己的日常生活?	○	○	○	○	○
n. 你有幾多時候因爲口腔或牙齒的問題(包括真牙或假牙)而令你什麼也做不到?	○	○	○	○	○

Appendix 2

Tooth Sensitivity Exam Form

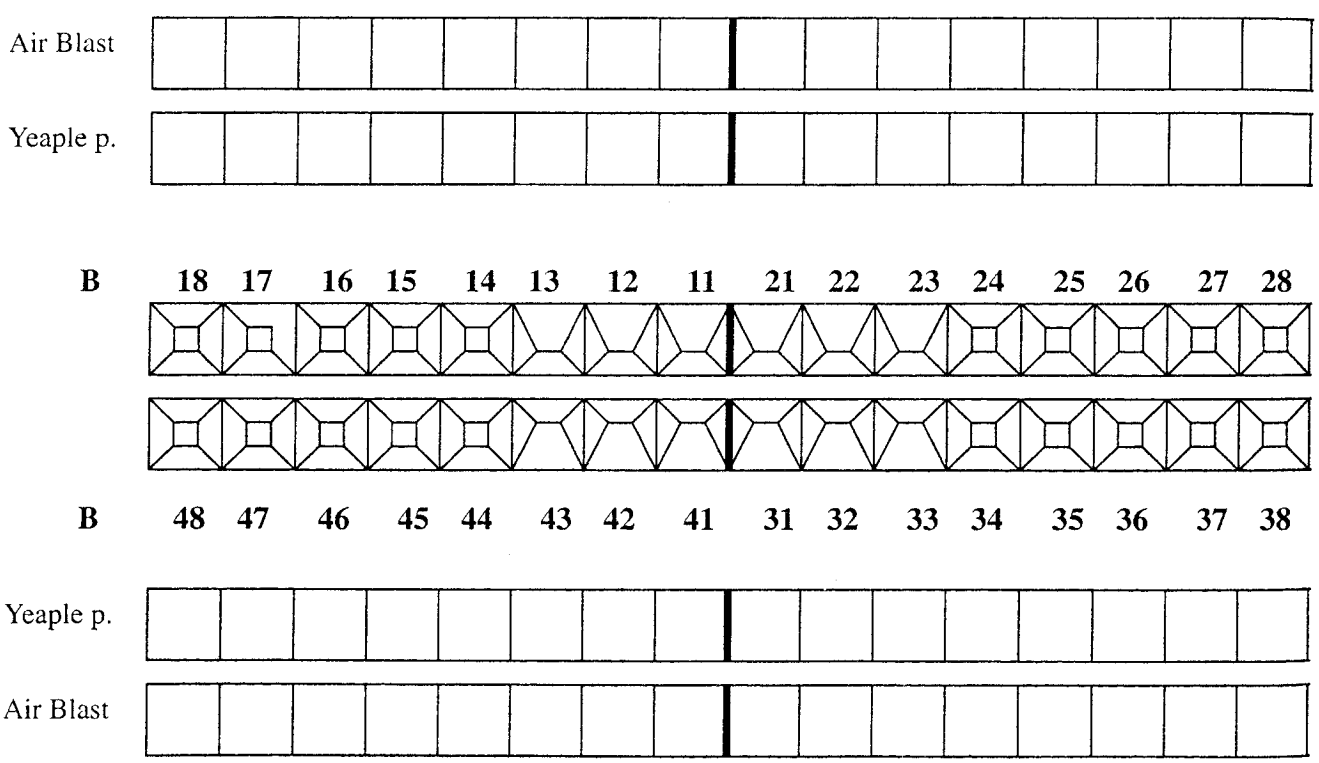
Date: _____

Name & PPDH No.: _____

Contact No.: _____

Examiner: _____

Pre-scaling ❑ Post-scaling ❑ Follow up (4wks) ❑



Schiff Air Blast Sensitivity Scale

0=Tooth/patient does not respond to air stimulus.

1=Tooth/patient responds to air stimulus but does not request discontinuation of stimulus.

2=Tooth/patient responds to air stimulus and requests discontinuation or moves from stimulus.

3=Tooth/patient responds to air stimulus, considers stimulus to be painful, and requests discontinuation of the stimulus.

Appendix 3

Consent Form

We are a group of final year dental students conducting a study on cervical dentine hypersensitivity. It would be much appreciated if you can help by filling in a questionnaire and to participate in a simple clinical examination. Participation in this study will not interfere with, delay, or have any degradative effects on either your oral condition nor the progress of treatment. At the end of the study, if necessary, you will be offered the best treatment for dentine hypersensitivity as made conspicuous from this study. **Thank you for your co-operation.**